Living With Fire

A Guide for Homeowners Living in the Wildland-Urban Interface

The Cottonville Fire

On May 5th, 2005, a wildfire began in northern Adams county. The fire started early in the afternoon on a day with weather conditions prime to spread flames. The day was warm and windy, 75 degrees with southwesterly winds of about 14 mph with gusts up to 22 mph. A relative humidity of only 18 percent meant the already dead grasses were now completely dry. In an area known as sand country, the dominant vegetation able to grow in the area is grass, pine, and scrub oak; all species known for their ability to burn quickly and intensely.

The fire rapidly spread through grass, needles and brush to the tops of the pine trees close by. Immediately after assessing the conditions of the fire, DNR fire control activated the Incident Management Team (IMT) while local law enforcement began evacuating ahead of the fire. Over 100 people were quickly evacuated to the Pineland Grade School where they were able to get information and assistance. Fire department resources were put on structural protection to try to defend the hundreds of homes, cabins, trailers, campers, and outbuildings in the area. Air resources included two DNR single-engine air tankers and a CL-215 from Minnesota DNR used for dropping water and fire retardant as well as two DNR air attack planes that directed the drops and worked as spotters for crews on the ground.

The fire was finally contained 11 hours later after 3,410 acres had burned. Crews were on the scene for several days extinguishing smaller fires within the containment area and mopping up afterwards. In total, the fire burned a swath 1.5 miles wide and 7 miles long through the Towns of Big Flats, Preston, and Colburn. Wildfire suppression and support resources included 38 tractor plows, 25 Forest Rangers with Type 7 4x4s, 3 low ground units, 6 heavy dozers and almost 200 DNR personnel as well as personnel from the US Fish and Wildlife Service, County Emergency Management, local Fire Departments and Adams County Sheriffs Department.

Mike Lehman, WDNR.

An estimated 300 buildings were saved due to firefighter assistance and in some cases because the homeowners had a fair amount of green space around structures. This green space, known in the fire world as "defensible space," creates a safer area for firefighters to work in when defending the home. In cases where firefighters are simply unable to assist every property, this defensible space is often enough for a home to survive a wildfire on its own. Some buildings survived but were damaged by the radiant heat of the flames or due to embers landing in and igniting flammable items like firewood stacks, mulch piles, and dead pine needles.

There were 9 year-round residences, 21 seasonal homes, and 74 outbuildings that were completely destroyed in the fire. The loss of these buildings was due, in part at least, to a lack of access to the property and a lack of defensible space. Some buildings, trailers, and campers were literally tucked in amongst a stand of dense pine trees, leaving them virtually no chance of surviving a wildfire. On these properties, several residential propane tanks vented and several smaller "20-pound" propane cylinders exploded.

After a thorough investigation, it was determined that the cause of the fire was debris burning. In this case, an attempt was made to burn off dry grass inside a campfire ring. The warm, dry, windy conditions resulted in a fire that easily escaped, resulting in the loss of millions of dollars in personal property and natural resources.

While the Cottonville Fire may be fresh in the minds of those that were there or lived nearby, it is by no means an uncommon occurrence. Wisconsin has a long history of destructive wildfires. Each year many homes across Wisconsin are destroyed, damaged, or threatened by wildfire. With the increasing number of homes and seasonal cabins being built in areas surrounded by highly flammable vegetation, structural protection has become the most difficult and important challenge to our firefighters.

However, the person who can have the most impact on if a structure will survive a wildfire is the homeowner. By incorporating "Firewise" principles **before** a fire event, homeowners can greatly increase the likelihood that their home will survive a wildfire, even if it does not see a fire truck over the course of a fire.

The articles in this publication talk about how to incorporate Firewise principles around your home, particularly developing defensible space, eliminating receptive fuel beds for blowing embers, and providing accessibility for fire equipment.

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The FIRE Environment

Larry Waskow, WDNR

A slight change in wind conditions is all it took to put structures directly in the path of this fire.

The fire environment includes many factors that affect the way a fire starts and behaves. In Wisconsin, the main components of the fire environment are weather, available fuels, and human behavior. These components affect the likelihood of a fire start, speed, and direction at which a fire will travel, intensity at which a wildfire burns, and the ability to control and extinguish a wildfire. Although weather cannot be changed, the fuels (vegetation) and human behavior can be modified. Consequently, many of our opportunities in reducing the wildfire threat lie in proper management and manipulation of wildland vegetation, and in changing our behavior.

Weather

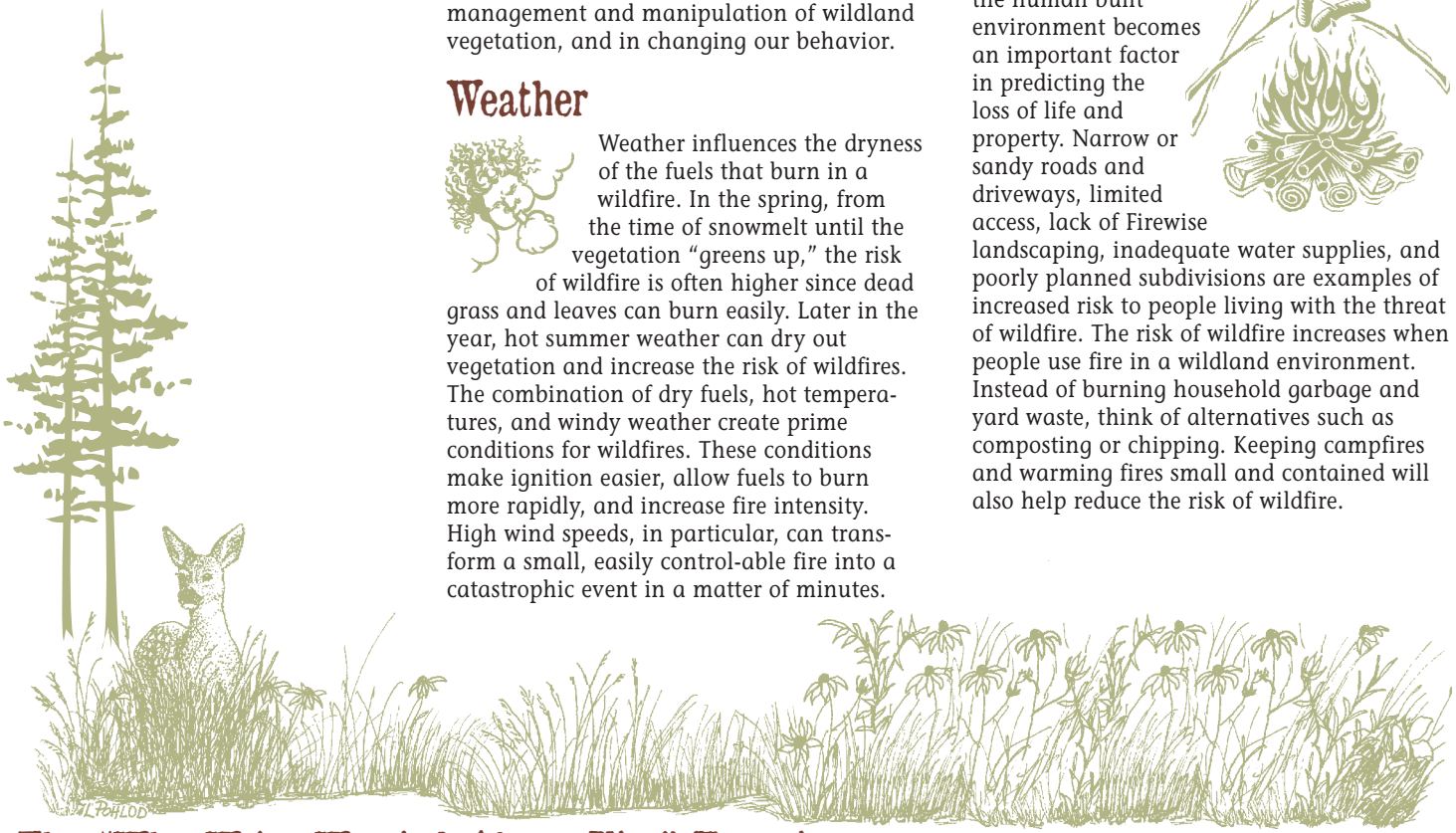
Weather influences the dryness of the fuels that burn in a wildfire. In the spring, from the time of snowmelt until the vegetation "greens up," the risk of wildfire is often higher since dead grass and leaves can burn easily. Later in the year, hot summer weather can dry out vegetation and increase the risk of wildfires. The combination of dry fuels, hot temperatures, and windy weather create prime conditions for wildfires. These conditions make ignition easier, allow fuels to burn more rapidly, and increase fire intensity. High wind speeds, in particular, can transform a small, easily control-able fire into a catastrophic event in a matter of minutes.

Available Fuels

Fuel is required for any fire to burn. With regards to wildfire, fuels consist of living vegetation (especially grass and evergreen trees and shrubs) and dead plant material (dead trees, dried grass, fallen branches, pine needles, dead leaves, etc.). Houses, vehicles, and other man-made objects can be thought of as "urban" fuels that can also burn during a wildfire. Altering the vegetation around the home and minimizing urban fuels around structures can keep a wildfire from reaching and destroying a home.

Human Behavior

When people are living in fire–prone environments, the human built environment becomes an important factor in predicting the loss of life and property. Narrow or sandy roads and driveways, limited access, lack of Firewise landscaping, inadequate water supplies, and poorly planned subdivisions are examples of increased risk to people living with the threat of wildfire. The risk of wildfire increases when people use fire in a wildland environment. Instead of burning household garbage and yard waste, think of alternatives such as composting or chipping. Keeping campfires and warming fires small and contained will also help reduce the risk of wildfire.



The "Why We're Worried About Fire" Equation

Fire is a natural part of our environment. Our forests and prairies were burning long before our cities and towns existed. **+**

People are living in this fire environment. Many homes are built and maintained without regard to wildfire. **+**

With more people using our wildlands, more human caused fire ignitions are likely. **+**

Today's wildfires can burn intensely and be difficult to control. **=**

Greater loss of life. Increased property losses. Damage to natural resources. More money spent on firefighting.

1850s – 1910	1854	1871	1887	1894	1914	1915	1930-1934
Fueled by slash left from the intensive logging of the era, large catastrophic fires are a common annual occurrence.	*A single wildfire runs from Amery to Iron River, a distance of 140 miles.*	*Peshtigo Fire: The deadliest fire in Wisconsin's history. Between 1,200 and 1,500 lives were lost and more than 1.5 million acres burned.*	*Marshfield burns to the ground.*	*July 27th the Phillips Fire burns over 100,000 acres, destroying 400 homes and much of the downtown area. 13 people died as they tried to escape by swimming across the lake.*	*National Fire Prevention Day inaugurated.*	*Jack Vilas made first forest fire patrol flight from Trout Lake on June 29th.*	*In the dust bowl era, severe drought ravaged the state. During this time period an average of 2,950 fires burned 336,000 acres annually in Wisconsin.*

The Three R's of Defensible Space

Removal: *The removal of entire plants, particularly evergreen trees and shrubs within the defensible space.*

Reduction: *The elimination of plant parts, such as leaves, needles, dead wood, low tree branches, and keeping the grass mowed.*

Replacement: *Substituting highly flammable plants with less hazardous vegetation, for example, removing evergreen shrubs and planting a well–maintained flower bed.*

Creating an Effective Defensible Space

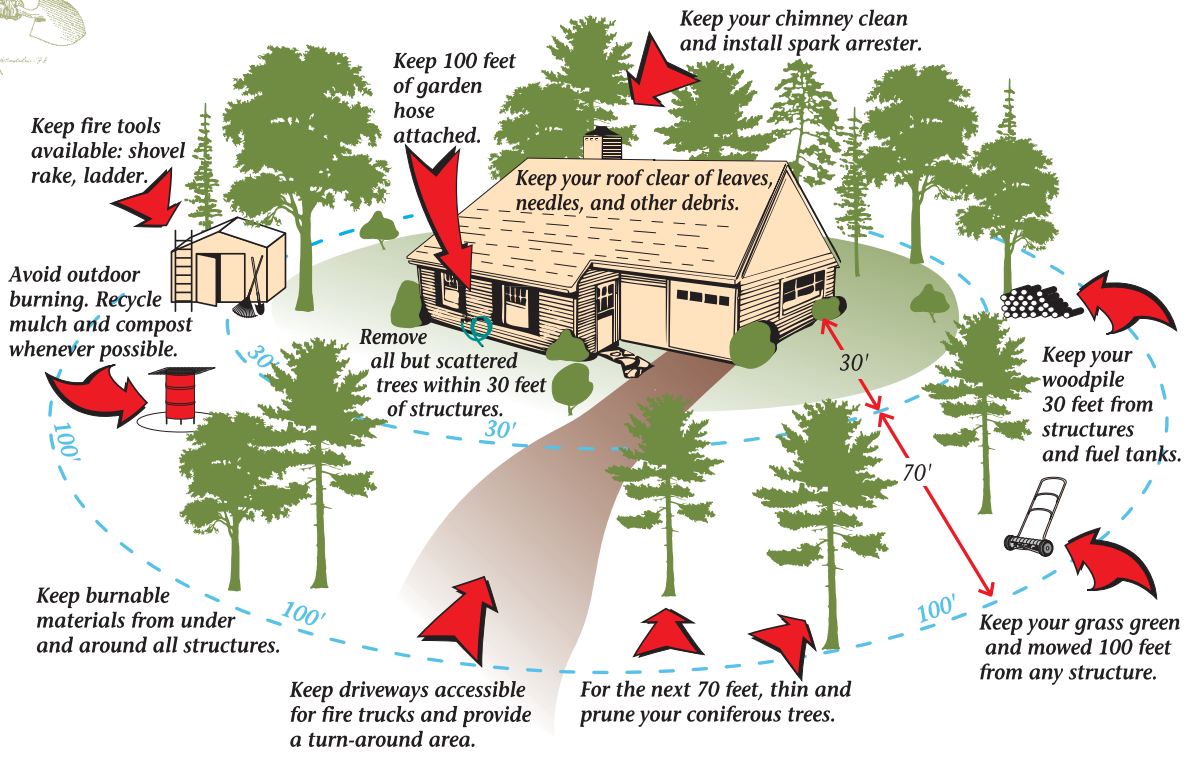
As the number of people living in and adjacent to wildlands grows, the likelihood of homes being threatened by wildfire also grows. A critical factor in determining whether or not a home will survive a wildfire is the type, amount, and maintenance of vegetation surrounding the house. Defensible space, sometimes referred to as "Survivable Space," refers to the area between buildings and an oncoming wildfire where the fuels have been modified enough to reduce wildfire threat and to provide an area where firefighters can safely work to defend the structures. With enough fuel reduction in the defensible space, your home may even be able to survive a wildfire without firefighter assistance.

The first 3 to 5 feet around structures should be a fuel-free zone. Avoid planting anything in this area or storing any flammable materials. Better yet, fill in this area with something completely non-flammable, such as decorative stone or gravel. Regularly clean the area to keep it free of any fallen leaves, branches, or pine needles.

For the next 30 feet, keep the grass cut short, well watered, and free of accumulated flammable debris. Trees and shrubs in this area should be well spaced and preferably restricted to deciduous species (those with leaves that drop in the fall). Look for potential "fuses" like wooden walkways, fences, and weedy gardens that reach from the woods to your buildings. Break these up with patios or green lawn. Keep flammables like lumber and firewood piles out of this area. As a final check, take a stroll around this area with an imaginary match in your hand. If you see a place where you would not feel comfortable lighting that match, throwing it down and walking away, you still have some Firewise work to do.

Continue to keep trees and shrubs well spaced in the area 30 to 100 feet around buildings. This is especially important if the area is predominantly evergreens. Thin trees and shrubs so that they are at least 10 feet apart. Prune branches off the remaining trees 6 to 10 feet up the trunk. This process reduces the "ladder fuels" that would allow a fire to move from the ground to the treetops and from tree to tree, resulting in uncontrollable crown fire.

Are You Prepared for Wildfire?



1935

The tractor/plow is established as standard fire suppression equipment. Occurrence of large wildfires decreases dramatically.

1948

Aldo Leopold, author of "A Sand County Almanac" dies while fighting a grass fire between Portage and Baraboo on April 28th.

1950

Smokey Bear makes first public appearance at the Fireman's Convention Parade in Hurley, Wis., August 3rd.

1959

On May 1st, a running crown fire in Burnett County burned 17,560 acres.

1960s

For the decade of the 1960s, an average of 1,880 fires burned 8,700 acres each year. Railroads were the leading cause of fire.

1977

Nearly 49,000 acres burned in 1977. Over 170 structures were destroyed or damaged. Areas worst hit were Jackson, Washburn, Douglas, and Wood Counties.

Are You Prepared for Wildfire?

- ✔ *Is your roof made of fire-resistant materials?*
- ✔ *Are your roof and gutters free of leaves, branches, and needles?*
- ✔ *Is the vegetation thinned out at least 30' around all structures?*
- ✔ *Is your driveway wide enough for a fire truck to make it to your home?*
- ✔ *Are tree limbs around structures pruned up 6 to 10' off the ground?*
- ✔ *Have you removed all flammable materials from under your deck?*
- ✔ *Have you moved your firewood stack at least 30' from structures?*
- ✔ *Do you regularly clear out dead vegetation around all structures?*
- ✔ *Do you have 100' of garden hose with a sprayer and sprinkler?*
- ✔ *Are your eave vents covered with 1/8" mesh screens?*

Regarding Your Roof

Jim Gobel, WDNR

Roofs and rain gutters should be kept free of fallen leaves, needles, and branches.

A house can be threatened by a wildfire in three ways: direct exposure from flames, radiation, and airborne firebrands. Of these, firebrands account for the majority of homes burned by wildfire. The most vulnerable part of a house to firebrands is the roof and gutters. For this reason, it is very important that all roofing materials be fire-resistant. A roof that is not fire-resistant is considered a critical factor, meaning that this issue alone can result in home loss should flying embers, sparks, or flames come in contact with the roof. If you are unable to update your roof with fire-resistant materials, you may want to consider alternatives such as a home sprinkler system.

Dead vegetation on roofs and around your home provides ideal locations for flying embers to land, smolder, and ignite. It is very important to keep a regular schedule of maintenance to keep these areas clear of fallen needles and leaves. You may want to install "gutter guards" to help keep these flammable materials out of rain gutters. Also, keep tree branches away from roofs. Remove all branches that hang over the roof, under the eaves, and within 15 feet of the chimney and make sure chimneys are fitted with spark arrestors.

When Fire Flies

Chris Klahn, WDNR

Firebrands helped this fire spread across a highway by igniting spot fires as they landed in the leaf litter.

Firebrands are burning embers produced by wildfire which are lifted high into the air and carried beyond the fire front. Firebrands are one of the **major causes** of homes burned due to wildfire. Typical firebrand materials include things like pine cones and bark. Depending on wind speed and size of materials, firebrands can be carried more than 1/2 mile ahead of the fire front. A shower of thousands of firebrands can be produced during a major wildfire event. If these firebrands land in areas with easily ignited fuels, such as piles of leaves or pine needles, numerous spot fires can start. Homes located blocks away from the main fire front can be threatened.

The Fire Department Will Save My House, Right?

Bob Focht, WDNR

Is your driveway wide enough for a fire truck?

Some individuals incorrectly assume that a fire engine will be parked in their driveway and firefighters will be actively defending their homes if a wildfire approaches. During a bad fire day when a major wildfire is burning or when several smaller fires are occurring at the same time, it is unlikely there will be enough firefighting resources available to defend every home. In these instances, firefighters will likely select homes they can safely and effectively protect.

Even with adequate resources, some wildfires may be so intense that there may be little firefighters can do to prevent a house from burning. The key is to reduce fire intensity as wildfire nears the house. This can be accomplished by reducing the amount of flammable vegetation surrounding a home.

Consequently, the most important person in protecting a house from wildfire is not a firefighter, but the property owner. And it's the action taken by the owner **before** the wildfire occurs (such as creating an effective *defensible space*) that is critical.

1980	1982	1988	1990s	2005
Over two days in April, the Ekdall Church Fire in Burnett County and the Oak Lake Fire in Washburn County burned over 16,000 acres and destroyed more than 200 buildings.	*DNR firefighter Donald Eisberner was killed in the line of duty on April 24th, at the Canoe Landing Fire in Eau Claire County.*	*Deer Print Fire, Douglas County, burns 817 acres.* *Lyndon Station Fire, Juneau County, burns 911 acres and three buildings.*	*For the decade of the 1990s, an average of 1,600 fires burned 3,400 acres each year. Debris burning was the leading cause of forest fires.*	*The Cottonville Fire in Adams county burned 3,410 acres. Over 100 buildings were destroyed, at least 300 were threatened.*

On Any Given Weekend: Simple Things You Can Do to Help Your Home Become "Firewise"

Improving your home's chance of surviving a wildfire can seem like an overwhelming task – one that you may feel is impossible to achieve. Not necessarily so! Research shows that flying embers (firebrands) and creeping surface fire are significant contributors to the loss of homes to wildfires . . . sometimes hours after the fire has passed.

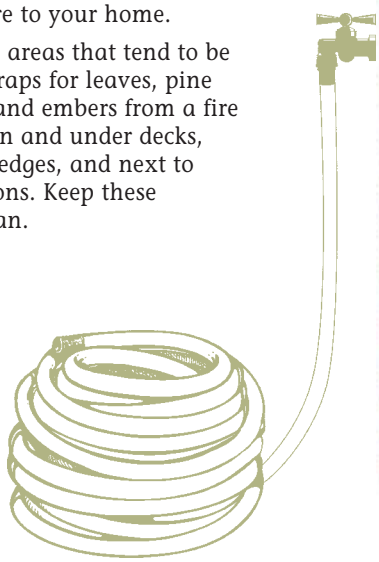
To begin making your home and property "Firewise," start with the structures on your property and move out as time allows. Keep in mind that anything attached to a structure (decks, fences, overhangs . . .) is part of the structure. The following tasks can easily be accomplished in one afternoon:

- ✔ Clean needles, leaves, and branches off roofs and out of rain gutters. This kind of material can easily ignite and spread fire to your home.
- ✔ Check all areas that tend to be natural traps for leaves, pine needles, and embers from a fire such as on and under decks, window ledges, and next to foundations. Keep these areas clean.
- ✔ If you keep a canoe next to the house, make sure there isn't a pile of leaves or needles hiding underneath!
- ✔ Keep 100 feet of garden hose hooked to a faucet. Attach a sprayer and keep a sprinkler close by. You may want to do this on more than one side of your home!
- ✔ Is that a hemp welcome mat in front of your door? Consider replacing it with something less flammable.
- ✔ Using wood chips or straw in your landscaping provides ideal places for embers to land, smolder, and ignite. If you use these kinds of organic mulches, use them sparingly and never along the sides of your home. Better yet, try less flammable alternatives such as brick chips or decorative stone.

Remember to keep a maintenance schedule to ensure your defensible space is lean, clean, and green **before** spring and fall – generally the worst times for wildfire in Wisconsin.

After you've done some initial work on the structure, it's time to begin working outward. Look to what may carry a fire to the structure and begin implementing "The Three R's of Defensible Space." Here are some ideas:

- ✔ Rake all dead grass, leaves, and pine needles away from the base of all structures.
- ✔ Remove tree branches that extend over your roof. Create extra space around chimneys: 15 feet will do.
- ✔ Move that firewood stack at least 30 feet from all structures. Embers have been known to smolder in firewood stacks and catch fire long after the fire itself has passed.
- ✔ Remove shrubs, saplings, or any other "ladder" fuels from under larger trees. Left in place, these can carry a surface fire into the treetops.
- ✔ Prune the lower 6 to 10 feet of branches off trees in your defensible space. Prune all dead branches you come across.
- ✔ Thin out your defensible space. Evergreens are especially flammable and should have at least 15 feet between the branches if they are within 100 feet of a structure. Consider replacing them with hardwoods.
- ✔ Remove any dead or down vegetation within 100 feet of your home.
- ✔ The grass is always greener . . . when it is kept watered. Don't allow grass to dry out around structures.
- ✔ Create a 10-foot clearance around your propane tank. Keep the grass mowed short or fill in the area with rocks or gravel.
- ✔ Talk to your neighbors about becoming "Firewise."



Phil Puestow, WDNR

Good access, green space, clean roof and gutters, and well-spaced trees pruned up high help to make this home Firewise.

Debris Burning: The #1 Cause of Wildfire in Wisconsin

Debris burning is the #1 cause of wildfire in Wisconsin. More than 1,000 fires each year are caused by debris burning. In most cases, the person responsible was burning outside local restrictions. Outdoor burning in Wisconsin is regulated and permits may be required whenever the ground is not completely snow covered. **Remember! If your open burning project grows into a wildland fire, you will be liable for suppression costs and damages to property, including the value of timber lost.** Instead of burning, people are encouraged to consider safer and more environmentally–friendly options like chipping, composting, recycling, and creating brush piles for wildlife habitat. However, if you should decide to burn, there are certain precautions you should take:

- ✔ In most areas a written permit is required. Check with your local DNR office, Emergency Fire Warden, or local fire officials **before** you burn to see if permits are required in your area.
- ✔ Do not begin burning until you fully understand your local burning regulations, techniques, and conditions for when is the safest time of day and year to burn.

In the Event of a Wildfire

If you are aware that a wildfire is in the vicinity and are not in immediate danger, consider doing the following:

- ✔ Attach your garden hose to an outside faucet and turn it on with the nozzle attached in the 'closed' position. Place a sprinkler by the hose if you have one.
- ✔ Remove flammable deck furniture.
- ✔ Put ladders up against the roof (non-flammable ones, of course).
- ✔ Clean off your roof, deck, and rain gutters.
- ✔ Close all windows and shutters. Remove flammable curtains.
- ✔ Leave power and outside lights on.
- ✔ Decide what you would take with you in case you must evacuate.
- ✔ Leave your house/cabin unlocked with a note inside of who evacuated, where you are heading, and the time and date. Don't forget your pets!
- ✔ Wait to burn until late spring after the grass has greened up and late in the day after the wind has died down.
- ✔ When burning piled materials, wait until the ground is completely snow-covered.
- ✔ Create a 10–foot clearing around any burning container or piled material.
- ✔ Keep brush piles small. If not completely extinguished, large piles can retain heat buried in the ash for days or even weeks and flare up on a windy day, potentially resulting in wildfire.
- ✔ Keep burning containers and brush piles away from overhanging branches.
- ✔ If you use a barrel, please stop! But if you must, ensure it is in good condition and the top is covered with a wire screen.
- ✔ Do not burn on dry, windy days!
- ✔ Always keep a hose and shovel on hand. Make sure the water is turned on until the burning is complete and the fire is dead out.
- ✔ **NEVER LEAVE YOUR OUTDOOR BURNING UNATTENDED!**

Check out These Internet Sites for More Fire-Related Information:

WDNR, Forest Fire Program Website
www.dnr.wi.gov/org/land/forestry/fire

Firewise
www.firewise.org

Arson Hotline
1-800-362-3005

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